

October 24, 2000

STL Sacramento 880 Riverside Parkway West Sacramento, CA 95605-1500

Tel: 916 373 5600 Fax: 916 371 8420 www.stl-inc.com

STL SACRAMENTO PROJECT NUMBER: G0I070252

Rae Mindock RMT, Inc. 222 S Riverside Plaza Suite 820 Chicago, IL 60606-5901

Dear Ms. Mindock,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on 9/7/00. These samples are associated with your Riverdale project.

The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916)374-4408.

Sincerely,

Kathy Gill

Project Manager

Kathy Liu

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STL SACRAMENTO PROJECT NUMBER G01070252

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STL Sacramento Quality Assurance Program

Sample Description Information

Chain of Custody Documentation

SOLID, 8290 Dioxins/Furans, HRGC/HRMS

Samples: 1, 2

Sample Data Sheets Method Blank Reports Laboratory QC Reports

SOLID, D 2216-90, Moisture, Percent

Samples: 1, 2

Sample Data Sheets Method Blank Reports Laboratory QC Reports

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G0I070252

SOLID, 8290 Dioxins/Furans, HRGC/HRMS

Several internal standard recoveries are lower than the recommended goal of 40% in the laboratory control sample associated with this batch.

The associated field samples have no internal standard recoveries outside the method limit. There are no positive results detected in the field samples for the affected analytes in the associated LCS with the exception of 2,3,7,8-TCDF.

Quantitation by isotope dilution generally precludes any adverse effect on data due to out of control internal standard recoveries. This is evidenced by the fact that all native spike recoveries in the LCS are within the method control limits.

There were no other anomalies associated with this project.

STL Sacramento Quality Control Definitions

Oc Parameter	Definition .
QC Batch	A set of up to 20 field samples plus associated laboratory QC samples that are similar in composition (matrix) and that are processed within the same time period with the same reagent and standard lots.
Duplicate Control Sample (DCS)	Consist of a pair of LCSs analyzed within the same QC batch to monitor precision and accuracy independent of sample matrix effects. This QC is performed only if required by client or when insufficient sample is available to perform MS/MSD.
Duplicate Sample (DU)	A second aliquot of an environmental sample, taken from the same sample container when possible, that is processed independently with the first sample aliquot. The results are used to assess the effect of the sample matrix on the precision of the analytical process. The precision estimated using this sample is not necessarily representative of the precision for other samples in the batch.
Laboratory Control Sample (LCS)	A volume of reagent water for aqueous samples or a contaminant-free solid matrix (Ottawa sand) for soil and sediment samples which is spiked with known amounts of representative target analytes and required surrogates. An LCS is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects.
Matrix Spike and Matrix Spike Duplicate (MS/MSD)	A field sample fortified with known quantities of target analytes that are also added to the LCS. Matrix spike duplicate is a second matrix spike sample. MSs/MSDs are carried through the entire analytical process and are used to determine sample matrix effect on accuracy of the measurement system. The accuracy and precision estimated using MS/MSD is only representative of the precision of the sample that was spiked.
Method Blank (MB)	A sample composed of all the reagents (in the same quantities) in reagent water carried through the entire analytical process. The method blank is used to monitor the level of contamination introduced during sample preparation steps.
Surrogate Špike	Organic constituents not expected to be detected in environmental media and are added to every sample and QC at a known concentration. Surrogates are used to determine the efficiency of the sample preparation and the analytical process.

Source: STL Sacramento® Quality Control Program, Policy QA-003, Rev. 0, 8/19/96.

Sample Summary G01070252

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
DK20H	1	SL53	9/6/00 11:00 AM 9	9/7/00 09:35 AM
DK20K	2	SL54	9/6/00 11:00 AM 9	9/7/00 09:35 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must no be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weigh

Chain of Custody Record

StL - West Sacremento



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DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy



LOT RECEIPT CHECKLIST

STL Sacramento

	PM KG LOG#_		
LOT (QUANTIMS ID) BOTO 76252 QUOTE	35444 LOCA	TION(3.73
DATE RECEIVED 9-7-00 TIME RECEIVED 09-34	38342	Initials	Date <u>9-7-</u> 00
DELIVERED BY CA OVERNIGHT AIRBORNE GOLDENSTATE UPS BAX GLOBAL	☐ DHL ☐ GO-GETTERS		
☐ QES COURIER ☐ B & B CUSTODY SEAL STATUS ☑ INTACT ☐ BROKEN ☐ N/A CUSTODY SEAL #(S)	A		
AMBIENT TEMPERATURE 12°			
COLLECTOR'S NAME:	Not on coc		
ph Measured Yes Anomaly Labeled by Labels Checked by	•	<u> </u>	
SHORT HOLD TEST NOTIFICATION SAMPLE	E RECEIVING HEM N/A		
METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL	_ ⊿N/A		
COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVE	N/A	Ψ.	
☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °-6 °C) ☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ PM NOTIFIED ☐ NO COOLING AGENTS USED Notes: SAMPLES HEAVING WEAPED IN BURSON		<u>cc</u>	9-7-00

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h = hydrochloric acid s = sulfuric acid n = sodium hydroxide n = nitric acid n = zinc acetate

* Number of VOA's with air bubbles present? total number of VOA's

Client Sample ID: SL53

Trace Level Organic Compounds

Lot-Sample #...: G0I070252-001 Work Order #...: DK20H102 Matrix.....: SOLID

Date Sampled...: 09/06/00 Prep Date....: 09/11/00 Date Received..: 09/07/00 Analysis Date..: 09/24/00

Prep Batch #...: 0255289

Dilution Factor: 1

		DETECTIO	N	
PARAMETER	RESULT	LIMIT	UNITS	METHOD
2,3,7,8-TCDD	24	1.4	pg/g	SW846 8290
Total TCDD	62	1.4	pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	2.1	pg/g	SW846 8290
Total PeCDD	47	7.2	pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	1.3	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND	2.8	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND	2.6	pg/g	SW846 8290
Total HxCDD	44	7.2	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	30	7.2	pg/g	SW846 8290
Total HpCDD	63	7.2	pg/g	SW846 8290
OCDD	190	14	pg/g	SW846 8290
2,3,7,8-TCDF	4.1 CON	1.4	pg/g	SW846 8290
Total TCDF	38	1.4	pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND	2.1	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	2.2	pg/g	SW846 8290
Total PeCDF	8.9	7.2	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND	3.1	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	1.7	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	1.8	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.22	pg/g	SW846 8290
Total HxCDF	4.9	7.2	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	8.6	7.2	pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	ND	0.95	pg/g	SW846 8290
Total HpCDF	18	7.2	pg/g	SW846 8290
OCDF	16	14	pg/g	SW846 8290
	PERCENT	RECOVERY		
INTERNAL STANDARDS	RECOVERY	LIMITS		
13C-2,3,7,8-TCDD	87	(40 - 13	5)	
13C-1,2,3,7,8-PeCDD	66	(40 - 13	5)	
13C-1,2,3,6,7,8-HxCDD	98	(40 - 13	5)	
13C-1,2,3,4,6,7,8-HpCDD	88	(40 - 13	5)	
13C-OCDD	65	(40 - 13	5)	
13C-2,3,7,8-TCDF	94	(40 - 13	5)	
13C-1,2,3,7,8-PeCDF	78	(40 - 13	5)	
13C-1,2,3,4,7,8-HxCDF	78	(40 - 13	5)	
13C-1,2,3,4,6,7,8-HpCDF	87	(40 - 13	5)	

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

CON Confirmation analysis.

Client Sample ID: SL54

Trace Level Organic Compounds

Lot-Sample #...: G0I070252-002 Work Order #...: DK20K102 Matrix.....: SOLID

Date Sampled...: 09/06/00 Prep Date....: 09/11/00 Date Received.:: 09/07/00 Analysis Date.:: 09/24/00

Prep Batch #...: 0255289

Dilution Factor: 1

		DETECTIO	N	
PARAMETER	RESULT	LIMIT	UNITS	METHOD
2,3,7,8-TCDD	37	1.3	pg/g	SW846 8290
Total TCDD	68	1.3	pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	1.1	pg/g	SW846 8290
Total PeCDD	19	6.3	pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	0.35	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND	1.3	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND	1.1	pg/g	SW846 8290
Total HxCDD	8.8	6.3	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	24	6.3	pg/g	SW846 8290
Total HpCDD	52	6.3	pg/g	SW846 8290
OCDD	210	13	pg/g	SW846 8290
2,3,7,8-TCDF	2.2 CON	1.3	pg/g	SW846 8290
Total TCDF	100	1.3	pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND	0.77	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.67	pg/g	SW846 8290
Total PeCDF	22	6.3	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND	1.1	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.71	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.57	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.30	pg/g	SW846 8290
Total HxCDF	3.4	6.3	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	6.2 Ј	6.3	pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	ND	0.59	pg/g	SW846 8290
Total HpCDF	18	6.3	pg/g	SW846 8290
OCDF	15	13	pg/g	SW846 8290
	PERCENT	RECOVERY	· •	
INTERNAL STANDARDS	RECOVERY	LIMITS		
13C-2,3,7,8-TCDD	73	(40 - 13	5)	
13C-1.2.3.7.8-PeCDD	49	(40 - 13)	(5)	

	PERCENT	RECOVERY
INTERNAL STANDARDS	RECOVERY	LIMITS
13C-2,3,7,8-TCDD	73	(40 - 135)
13C-1,2,3,7,8-PeCDD	49	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	81	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	74	(40 - 135)
13C-OCDD	53	(40 - 135)
13C-2,3,7,8-TCDF	76	(40 - 135)
13C-1,2,3,7,8-PeCDF	64	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	62	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	71	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

CON Confirmation analysis.

J Estimated result. Result is less than the reporting limit.

QC DATA ASSOCIATION SUMMARY

G0I070252

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	SW846 8290 ASTM D 2216-90		0255289 0255421	
002	SOLID SOLID	SW846 8290 ASTM D 2216-90		0255289 0255 4 21	

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G0I070252 Work Order #...: DL4CR101 Matrix..... SOLID

MB Lot-Sample #: G0I110000-289

Prep Date....: 09/11/00 Prep Batch #...: 0255289

Analysis Date..: 09/21/00

Dilution Factor: 1

DETECTION

		DETECTION	ON	
PARAMETER	RESULT	LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.18	pg/g	SW846 8290
Total TCDD	1.3	1.0	pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	0.41	pg/g	SW846 8290
Total PeCDD	ND	1.2	pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	0.30	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND	0.28	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND	0.26	pg/g	SW846 8290
Total HxCDD	ND	0.30	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	ND	0.28	pg/g	SW846 8290
Total HpCDD	ND	0.28	pg/g	SW846 8290
OCDD	ND	1.5	pg/g	SW846 8290
2,3,7,8-TCDF	ND	0.14	pg/g	SW846 8290
Total TCDF	ND	0.14	pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND	0.22	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.21	pg/g	SW846 8290
Total PeCDF	ND	0.22	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND	0.25	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.22	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.27	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.28	pg/g	SW846 8290
Total HxCDF	ND	0.28	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	ND	0.25	pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	ND	0.32	pg/g	SW846 8290
Total HpCDF	ND	0.32	pg/g	SW846 8290
OCDF	ND	0.46	pg/g	SW846 8290
	PERCENT	RECOVERY	ď	
INTERNAL STANDARDS	RECOVERY	LIMITS		
13C-2,3,7,8-TCDD	81	(40 - 13)	35)	
13C-1,2,3,7,8-PeCDD	63	(40 - 13)	35)	
13C-1,2,3,6,7,8-HxCDD	92	(40 - 13)	35)	
13C-1,2,3,4,6,7,8-HpCDD	82	(40 - 13)	35)	
13C-OCDD	73	(40 - 13	35)	
13C-2,3,7,8-TCDF	69	(40 - 13	35)	
13C-1,2,3,7,8-PeCDF	73	(40 - 13	35)	
13C-1,2,3,4,7,8-HxCDF	64	(40 - 13	35)	
13C-1,2,3,4,6,7,8-HpCDF	86	(40 - 13	35)	

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G0I070252 Work Order #...: DL4CR102 Matrix.....: SOLID

LCS Lot-Sample#: G0I110000-289

Prep Date....: 09/11/00 Analysis Date..: 09/21/00

Prep Batch #...: 0255289

Dilution Factor: 1

	SPIKE	MEASURED		PERCENT	
PARAMETER	AMOUNT	AMOUNT	UNITS	RECOVERY	METHOD
2,3,7,8-TCDD	20.0	15.8	pg/g	79	SW846 8290
1,2,3,7,8-PeCDD	100	93.6	pg/g	94	SW846 8290
1,2,3,4,7,8-HxCDD	100	81.6	pg/g	82	SW846 8290
1,2,3,6,7,8-HxCDD	100	80.5	pg/g	80	SW846 8290
1,2,3,7,8,9-HxCDD	100	78.5	pg/g	78	SW846 8290
1,2,3,4,6,7,8-HpCDD	100	83.3	pg/g	83	SW846 8290
OCDD	200	177	pg/g	88	SW846 8290
2,3,7,8-TCDF	20.0	17.8	pg/g	89	SW846 8290
1,2,3,7,8-PeCDF	100	85.5	pg/g	86	SW846 8290
2,3,4,7,8-PeCDF	100	78.4	pg/g	78	SW846 8290
1,2,3,4,7,8-HxCDF	100	85.2	pg/g	85	SW846 8290
1,2,3,6,7,8-HxCDF	100	89.7	pg/g	90	SW846 8290
2,3,4,6,7,8-HxCDF	100	94.2	pg/g	94	SW846 8290
1,2,3,7,8,9-HxCDF	100	92.6	pg/g	93	SW846 8290
1,2,3,4,6,7,8-HpCDF	100	84.8	pg/g	85	SW846 8290
1,2,3,4,7,8,9-HpCDF	100	86.8	pg/g	87	SW846 8290
OCDF	200	166	pg/g	83	SW846 8290

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	44	(40 - 135)
13C-1,2,3,7,8-PeCDD	31 *	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	48	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	54	(40 - 135)
13C-OCDD	53	(40 - 135)
13C-2,3,7,8-TCDF	38 *	(40 - 135)
13C-1,2,3,7,8-PeCDF	38 *	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	39 *	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	55	(40 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

^{*} Surrogate recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G0I070252 Work Order #...: DL4CR102 Matrix.....: SOLID

LCS Lot-Sample#: G0I110000-289

Prep Date....: 09/11/00 Analysis Date..: 09/21/00

Prep Batch #...: 0255289

Dilution Factor: 1

	PERCENT	RECOVERY	
PARAMETER	RECOVERY	LIMITS	METHOD
2,3,7,8-TCDD	79	(50 - 150)	SW846 8290
1,2,3,7,8-PeCDD	94	(50 ~ 150)	SW846 8290
1,2,3,4,7,8-HxCDD	82	(50 - 150)	SW846 8290
1,2,3,6,7,8-HxCDD	80	(50 - 150)	SW846 8290
1,2,3,7,8,9-HxCDD	78	(50 - 150)	SW846 8290
1,2,3,4,6,7,8-HpCDD	83	(50 - 150)	SW846 8290
OCDD	88	(50 - 150)	SW846 8290
2,3,7,8-TCDF	89	(50 - 150)	SW846 8290
1,2,3,7,8-PeCDF	86	(50 - 150)	SW846 8290
2,3,4,7,8-PeCDF	78	(50 - 150)	SW846 8290
1,2,3,4,7,8-HxCDF	85	(50 - 150)	SW846 8290
1,2,3,6,7,8-HxCDF	90	(50 - 150)	SW846 8290
2,3,4,6,7,8-HxCDF	94	(50 - 150)	SW846 8290
1,2,3,7,8,9-HxCDF	93	(50 - 150)	SW846 8290
1,2,3,4,6,7,8-HpCDF	85	(50 - 150)	SW846 8290
1,2,3,4,7,8,9-HpCDF	87	(50 - 150)	SW846 8290
OCDF	83	(50 - 150)	SW846 8290
		PERCENT	RECOVERY
INTERNAL STANDARD		RECOVERY	LIMITS
13C-2,3,7,8-TCDD		44	(40 - 135)
13C-1,2,3,7,8-PeCDD		31 *	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	*	48	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD		54	(40 - 135)
13C-OCDD		53	(40 - 135)
13C-2,3,7,8-TCDF		38 *	(40 - 135)
13C-1,2,3,7,8-PeCDF		38 *	(40 - 135)
13C-1,2,3,4,7,8-HxCDF		39 *	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF		55	(40 - 135)

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

^{*} Surrogate recovery is outside stated control limits.

SOLID, 8290 Díoxíns/Furans, HRGC/HRMS

SOLID, D 2216-90, Moisture, Percent

Client Sample ID: SL53

General Chemistry

Lot-Sample #...: G0I070252-001
Date Sampled...: 09/06/00

Work Order #...: DK20H

Matrix....: SOLID

PREPARATION-

Date Received..: 09/07/00

PARAMETER

RESULT 30.2

UNITS

ANALYSIS DATE BATCH #

Percent Moisture

0.10

ASTM D 2216-90

09/11/00 0255421

PREP

Dilution Factor: 1

Client Sample ID: SL54

General Chemistry

Lot-Sample #...: G0I070252-002

Work Order #...: DK20K

Matrix..... SOLID

Date Sampled...: 09/06/00

Date Received..: 09/07/00

 PARAMETER
 RESULT
 RL
 UNITS
 METHOD
 ANALYSIS DATE
 BATCH #

 Percent Moisture
 20.9
 0.10
 \$\frac{4}{2}\$
 ASTM D 2216-90
 09/11/00
 0255421

Dilution Factor: 1